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How Petroleum Products Got Moving

By Tim Grace
Staff Reporter

THE distribution of petroleum products has become faster, easier, but more expensive since 1909, when railroad tank cars and barges were aided by the trusty horse.

The transition from animal to machine began in 1909 when four of the Standard Oil companies began using tank trucks. The "transports" featured open cabs and 400-gal. railroad-type riveted tanks.

By 1913, payloads swelled with the introduction of the double-bottom welded tank, enabling an additional 150 gal. to be delivered. The new tank design cut tank weight almost in half and signaled the start of a continuing effort to increase payload and cut dead weight.

The use of tank cars and barges, while still the primary means of transportation, soon became less vital with improved roads and, later, interstate highways.

The introduction of aluminum tanks and chassis in 1929 boosted payload an additional 20%, and tandem rear axles increased double-bottom capacity to 6,200 gal.

Additional payload proved beneficial to jobbers, but the development of bigger tractors and tanks was threatened during the Thirties. Then, Interior Secretary Ickes publicly complained about increasing truck size and lowered safety.

"The lord of the highway is the truck driver," said Ickes, addressing the American Automobile Assn. in 1939. "The monster which he drives . . . each year seems to be growing longer and wider and higher. And, if one truck isn't big enough to satisfy the road appetite of its owner, he can always attach a trailer."

Ickes concluded, "I have promised someday to give myself the pleasure of driving down a truck-infested road in the biggest armored tank that I could find and bump these pests from the road."

Trucks survived both Ickes' tirades and the emergence of the pipeline as the primary means of product transportation.

Regardless of the mode of transportation, its cost over the years generally has increased more than rates of inflation. Numerous pieces of legislation at the federal, state and local levels have mandated the use of costly safety and environmental equipment. The regulation and subsequent deregulation of the trucking industry have increased costs even further. [See chart.]

The application of stage I vapor recovery systems on tractors during the Seventies added an estimated $2,300 to the cost of each unit, according to one tank manufacturer. The equipment includes vapor hoods, piping, fittings, extra hose and hose carriers and strong overturn rails. The specifications added some 500 lbs. deadweight at the expense of payload.

Bottom-loading tanks, anti-locking brakes, emission control devices and cab noise control devices that entered the picture during the Seventies also helped beef up transport costs.

Various excise taxes on trucks, trailers and tires, coupled with more recent increases in federal fuel taxes, also have hurt operators [NPN—Aug. '83, p47].

Tractor costs have doubled since 1971. By last year, transport costs had escalated to as much as $110,000 per unit—up from $36,000 in 1971, $41,500 in 1973 and $75,000 in 1978.

Jobbers who had looked at used trucks as an answer to higher costs, found no solace by the '80s when the cost of a used truck was as high as $40,000. Experts cautioned too that truck quality had not kept pace with price.

Operating costs for the trucking industry as a whole also have increased. A Hertz Corp. study showed that all classes of trucks in 1950 cost an average 12.11¢ per mile to operate, with yearly repair and maintenance costs adding up to $1,294. By 1972, the figures increased to 24.69¢ per mile or $3,028 per year. In 1981, trucks cost 79¢ per mile to operate and $8,380 in maintenance expenses.

These expenses have been counteracted to an extent by developments in equipment and materials. A significant 93% of jobbers surveyed by the National Oil Jobbers Council found it cost-efficient to own at least one transport.

As truck costs rise, so has the necessity to achieve maximum utilization of rolling stock. From the early days of 400-gal. riveted tanks, tank capacity increased to an average of 7,800 gal. by 1959 and to an average 8,900 gal. in 1983. National Tank Truck Carriers, Inc. (NTTC) cites the use of 11,000 gal. tanks in some states.

Profitable Lightweights

Larger capacities are the result of continuing efforts to use lighter materials in tractors, tanks, accessories and parts.

Manufacturers, as early as 1939, were incorporating lighter alloy steels to maximize payload. More recently, aluminum has been used for tanks, bumpers, cab components, fuel tanks, hubs, transmission cases and wheels.

Manufacturers and transport owners realized that aluminum was worth its weight in gold during the late fifties. "After initial fire marshal objections to the early tanks, all majors dropped steel in favor of the lighter weight material, the last changing over by 1965," *NPN* reported in 1973.

With gross vehicle weight limits in the early Seventies lower than today's, jobbers realized the importance of making every pound count. Aluminum components saved 5,000 lbs. per vehicle, according to industry figures, allowing jobbers an extra 901 gal. per trip.

Even now, with a maximum allowable

Double-bottom, riveted tank trucks of the 1910s allowed for larger deliveries.

Around the turn of the century, the 'horseless carriage' relied on the horse for fuel.

weight of 34,000 lbs. for tankwagons, jobbers continue to use lightweight equipment in order to increase their payload.

Cost-cutting equipment now standard throughout the trucking industry includes plastic tractor components such as fenders, grills, fan blades and wind deflectors and air disc brakes.

Cabs and tanks made entirely with plastic did not live up to promises made during the Fifties. But steel-reinforced plastics soon began gaining acceptance.

"You'll gain at least 400 lbs. payload with reinforced plastic, instead of 20-gauge steel for truck cabs," said B.C. Harris, an engineer in charge of future designs for White Motor Co. in 1959.

Radial tires quite rapidly came to dominate the trucking industry. They are credited with saving jobbers thousands of gallons of fuel each year. Some now report savings of as much as 30% since switching from bias ply tires.

More attention currently is paid to the most important equipment on transport, the driver. A fleet maintenance manager told *NPN* in 1982 that drivers can affect fuel economy by as much as 25% by paying strict attention to idling time and shifting. This company coached its drivers to improve driving habits.

Biggest Development Diesel

Over the past 25 years, the most significant development in truck efficiency has been the emergence of diesel as the fuel for transports.

Diesel tractors generally have required a larger initial investment, but jobbers have lauded their advantages since full-scale implementation in the late Sixties.

The predominance of diesel and the decline of the gasoline powered tractor was forecast in *NPN's* 50th anniversary issue by C. Austin Sutherland, then president of NTTC. He wrote: "As weights increase, and as daily mileage per vehicle increases, fuel and engine costs are likely to make greater use of diesel inevitable."

The price difference between gasoline and diesel fuel continues to increase, with diesel proving to be slightly more economical by the end of 1983.

Gasoline powered bobtail trucks, used mainly for heating oil delivery, average about 1 mpg. Diesel tractors are achieving nearly 6 mpg and showing promise of further economy.

Diesel engines, according to their users, also prove easier to maintain and perform for longer periods without the need for engine overhaul.

"In 10 years, we go through two gasoline motors or new blocks," said William Sortor, president of Sunrise Oil, Englewood, N.J. in 1974. "We haven't even had to resleeve the cylinder bores on any diesel."

Diesel powered tractors also have delivered more horsepower than gasoline engines. The extra power has proven useful with today's heavier loads and has added a safety dimension in hilly areas and on interstate highways.

Should the price of diesel increase dramatically, jobbers might convert to propane which traditionally has been less expensive than diesel.

Preventative Maintenance

Jobbers have learned to cope with regulations, increasing truck costs and taxes through the use of preventative maintenance programs.

"A truck is wide open to problems if neglected," said Frank Snyder, a former trucking executive, in 1979. "Consistent checks tell you what the daily problems are before they get larger," he said.

The importance jobbers have placed on keeping accurate and detailed records is underscored by the fact that in recent years, many have installed computers to store pertinent information.

Other jobbers have replaced older trucks to save on repair costs. Renowned head of the old, San Antonio-based Sigmor chain, Tom E. Turner—also president of Mission Petroleum Carriers, Inc.—said in 1974 that 90% of his equip-

How Transport Costs Have Risen

	CPI#	Tractor/trailer cost*	¢ per mile*
1967	100.0	$28,000	NA
1968	104.2	29,626	24¢
1969	NA	NA	NA
1970	116.3	29,334	26
1971	121.1	28,472	27
1972	125.3	27,166	28
1973	133.1	27,778	30
1974	147.7	30,733	38
1975	161.2	32,393	40
1976	170.5	30,516	41
1977	181.5	31,136	46
1978	195.3	35,678	53
1979	217.2	36,306	60
1980	236.1	36,886	72
1981	259.6	36,722	82

Source: Hertz Corp.

* Figures represent average expenses for all types of tractor trailer combos in terms of real, inflation-adjusted dollars. Cent-per-mile figures in current, non-inflated dollars.

\# Consumer Price Index, using 1967 as the base year.

ment was less than two years old. Per-mile operating costs averaged 16¢ at Mission, not including driver insurance, license and taxes. Turner determined that average costs would increase to 23¢ per mile, if the tractors were overhauled and kept in service an additional two years.

Today's higher tractor costs, coupled with the emergency of in-frame overhauls—$9,000 less than conventional overhauls—has discouraged early vehicle replacements in more recent years.

Common Carriers

Common carriers first became popular during the Twenties. "Independent marketers using trucks to haul their supplies from refineries and terminals found that they were making a nice profit," *NPN* reported in 1939." They began transporting for their brother marketers at rates well below those of the rails." It was reported that marketers still had comfortable margins and soon bought more trucks and devoted more time to the transportation end of the business.

Common carriers once were viewed as supplements to private fleets. They became more popular, however, as costs began to rise.

Kim Marshall, operations manager of Marshall Oil Co., Wake Forest, N.C., told *NPN* in 1977 that leasing tractors saved his company $77,000 the first year alone. Marshall did not have to hire mechanics and had his drivers perform repairs on his tankwagons.

Typically, in order to benefit from the use of common carriers, a jobber should be located in a metropolitan area. Rural jobbers need freedom of mobility associated with private fleets.

Other Transportation

Trucks have been and remain the primary transportation concern of jobbers. Pipelines, however, have served as the chief means of moving product from refinery gates since the Fifties.

U.S. Census Bureau statistics show that in 1977, 52% of all petroleum products were being shipped by pipeline, compared to 29% by water, 14% by truck, 3% by rail and 1% by other means.

Pipeline growth came mostly at the expense of rail, being faster and far less expensive. For instance, the National Petroleum Assn. told *NPN* in 1939 that transporting refined oils by rail cost more than 2½ times the expense of pipeline shipment.

Since the Thirties when pipelines first began to thread the national landscape, physical and technological barriers gave way to environmental objections. Construction of the Alaskan Pipeline during the Seventies was delayed due to public concern for wildlife habitat. And, the Northern Tier project, which was to have run through Puget Sound in Washington to the Midwest, was scrapped last summer.

The year 1966 marked the arrival of the super-tanker, with California Texas Oil's Tokyo Maru hauling 500,000 bbl. of gasoline at $1.70 per ton. But despite the attractive transportation cost, few ports were able to accommodate a ship of that size.

Thus, the time-proven barge remains the dominant mode of water transportation for refined product even today. And, although pipelines deliver more product daily than the lumbering barge, petroleum is the number one commodity shipped on the nation's inland waterways—ahead of agricultural and steel products.

Railroads, the iron horse that built America, are no longer dotted with tank cars for hauling gasoline. Cheaper rates made possible by "jumbo" tank cars made the rails more attractive for some products, however. In 1959, Phillips and Sohio had ordered 22,000-gal. tank cars to haul products such as lube oil and petrochemicals. Conventional cars of the time had capacities of 8,000 to 10,000 gal.

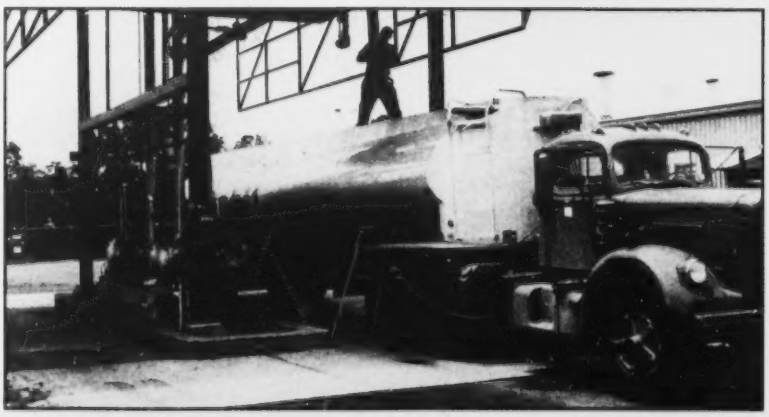
Bulk Plants

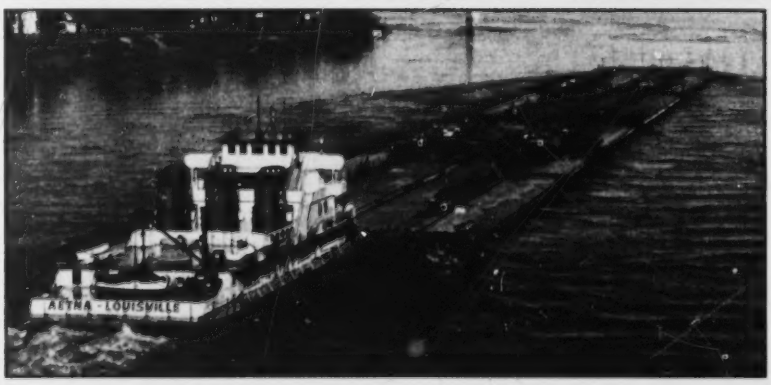
No matter how a product is brought from the refinery, it must be stored somewhere after it reaches its destination. Once the U.S. product pipeline network reached its current scale in the Sixties, few bulk plants were built. The fact is, pipelines themselves store a lot of product.

U.S. Census Bureau figures show 12,101 bulk plants in operation in 1981. Thirty years earlier, 28,320 plants were in operation.

Although *NPN* reported in 1971 that bulk plant storage had been bypassed by the transport, bulk plants today remain an important link in petroleum storage and distribution in rural areas where jobbers face longer hauls. Thus, while the pipeline figures to remain the chief method of moving product in the coming years, with the transport being the primary means of secondary distribution.

The future of petroleum transportation, however, rests largely in the hands of government. Increases in gross vehicle weight limits and environmental regulations will dictate the industry's course over the next 25 years.





Futuristic truck designs of the Thirties (right) begot the diesel-fueled models (below). This, while the age-old barge remains a viable means of transportation.

75th 1909 1984 ANNIVERSARY

Heating Oil Survives Fight with Gas; Sulfur Laws, Embargo Bludgeon Resid

By J. Richard Shaner
Executive Editor

FUEL oils never have been worshipped like gasoline or glorified with anything resembling the annual billions offered up in the name of motor fuel R&D and advertising. Nevertheless, they are much more important to petroleum's past, present and future than most industry people probably realize.

Often fuel oils are shrugged off or ignored as the dirty necessities that command little attention or respect in the upper echelons of marketing management. There, just about everyone's attention is riveted to gasoline prices and street competition.

The record, however, makes that focus seem myopic. Middle distillates and residual fuel oil are and have been the industry's No. 2 and No. 3 products by volume. Or, to make the perspective a bit sharper, the No. 2 product by genre right behind gasoline is fuel oil.

In 1982, for instance, fuel oil accounted for 31% of the average crude barrel going through a U.S. refinery, compared with gasoline's 46%. All of the rest of the products combined accounted for only 23%.

What's equally significant, though, is the fact that the current market value of the two fuel oils still exceeds $65-billion a year. Not bad at all, considering the depressed conditions of recent years and that gasoline, although christened with cash outlays, is not that far beyond—a little more than $100-billion.

At this point in time, as *NPN* observes its 75th birthday, both gasoline and fuel oil have question marks on their futures. Where either or both will be in the good year 2009, when *NPN* celebrates its centennial anniversary, is strictly a guessing game right now. In fact, few among us could have guessed 75 years ago the turbulent years of growth and change that were to follow.

In 1909, when *NPN* was born in a little print shop in Cleveland, Ohio, oil's prime products were kerosine for illumination and lubricants for industrial machines. A gasoline market was beginning to emerge as the horseless carriages grew in numbers and importance.

Fuel oil's history dates back to World War I when the first of an increasing number of coal furnaces were converted to burn, in blast-torch style, a liquid product that was cheap, ashless and easier to handle than the bulky traditional fuels. It also was quite smelly and far from clean, but even this didn't deter its admirers who no longer had to shake furnaces several times a day or haul ashes out of the cellar.

Whithering Heights

It would be nice to say that from these humble beginnings, fuel oil has been unstoppable and unbeatable as a space-heating fuel—its primary purpose in life until the past year or so. But alas, that's not true at all.

In 1920, about 12,000 householders were using oil to keep themselves warm and comfortable. In 1930, the number had skyrocketed to 650,000; in 1940, to 2-million; in 1950 to 5-million; in 1960 to 9.8-million; in 1970, to 12-million. The peak came in the mid-70s at 17-plus-million. But the total has been slipping since then, and it is now down to 11-million homes.

What caused oil heat's downfall was that old American trait, competition, and the seeming inability of an industry composed of thousands of distributors to compete with price-controlled natural gas and with the monolithic public utilities which spread-eagled their marketplaces and outspent them by millions of dollars, (especially in the new home construction field).

Prior to World War II, natural gas was available mostly in the areas adjacent to oil field activity—primarily the Mid-Continent and the Southwest, and the Appalachian chain in eastern West Virginia, Pennsylvania and New York. Low-Btu manufactured gas was the product in the northeastern quadrant where fuel oil had become king.

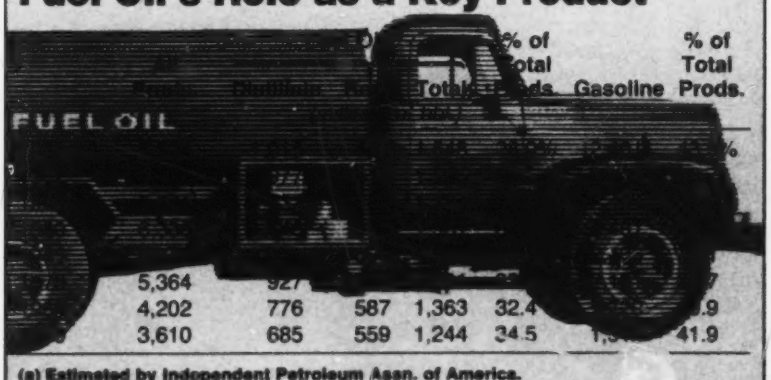
After the war, the government sold the "Big Inch" and the "Little Inch" pipelines—twin 36-inch and 30-inch lines. They ran from the Southwest to the industrial East and carried oil and products by land to escape the German U-Boat menace off the U.S. Coast. The lines were converted to natural gas, and great volumes of it came hurtling to the Atlantic seaboard and, in a parallel fashion, to the Upper Midwest.

These were high-Btu fuels, and, with the switch-over of kitchen ranges and tremendous promotion, they invaded traditional fuel oil markets like a bunch of runaway kids.

By 1958, natural gas had outstripped fuel oil on a national basis and was giving it hard times in its historic markets in the Middle Atlantic and Northeast. By 1982, natural gas had almost three times as many homes as fuel oil nationally.

But gas also had a competitor, electricity. The electric power companies outspent both gas and oil heat combined in

Fuel Oil's Role as a Key Product



				% of Total		% of Total Prods.
				Totals	Gasoline	
5,364	927					
4,202	776	587	1,363	32.4		41.9
3,610	685	559	1,244	34.5		41.9

(a) Estimated by Independent Petroleum Assn. of America.
Source: NPN Factbook and Energy Information Administration, DOE.

promotion and, by the early 1980s, had amassed more than 14-million customers. But electric heat ran into big troubles when its consumer costs went right through the roof and it went into kind of a holding pattern in the early 1980s, although builders continued to favor it.

In the Northeast in 1982, fuel oil was still the No. 1 fuel but its hold was slipping. In the Middle Atlantic states, the Upper Midwest and the Pacific Northwest, oil heat's battle was an uphill affair.

During these years, fuel oil used up an increasing volume of petroleum's annual product.

In 1930, for example, distillate and resid combined required a little less than 350-million bbl. It was a half-million bbl. in 1940; almost 1-billion in 1950; almost 2-billion bbl. by 1970; and roughly 2-billion bbl. annually until the 1980s, when it began to drop off. In 1982, consumption of middle distillates and resids dropped to 1.6-billion bbl., the lowest level since the mid-1960s.

Resid, a Shooting Star

The rise and fall of resid was probably the most dramatic development.

Distillate fuel oil consumption rose almost steadily through the years from 86-million bbl. in 1935 to 1-billion-plus in 1982. It dropped to 975-million bbl. in 1982 but was expected to get back over the 1-billion-bbl. mark in 1983.

Resid, on the other hand, went from 279-million bbl. in 1935 to 1.1-billion bbl. in 1977 before plummeting like a dying duck. By 1982, resid consumption had skidded to 634-million bbl., and it had been anticipated that the 1983 total would be only a little over 500-million bbl.

What happened to resid? Mostly price and environmental regulations.

Resid used to be a fairly cheap fuel for big complexes and commercial/industrial operations. In addition, resid had a higher Btu content than distillate—140,000 Btus per gal. to the latter's 100,000 Btus. Even though it required a pre-heating furnace, the economics were in its favor—8¢, 9¢ and 10¢ gal.

But with the embargo in 1973, resid prices skyrocketed, as did those of all other petroleum products. At one point, they weren't far below No. 2, in the $1 gal. range. At the same time, government pushed its environmental restrictions and limited the sulfur content of the fuel. This also resulted in price escalations.

The electric utilities, which were using almost a half-billion gal. of resid as recently as 1975, cut their consumption in half by 1982 and switched back to coal. Similarly, space heating, which had accounted for 154-million bbl. in 1975, dropped to 65-million bbl. in 1982.

The long-term outlook for resid is as gloomy and dark as the color of the fuel itself. Marine vessels are the biggest users of resid now but with this field contracting, there aren't too many ways to go.

Strange things are happening to distillate fuels too.

Historically, distillates were used as space-heating fuels. They went from a mere 54-million bbl. in 1935 to more than a half-billion bbl. in 1970. The wild price increases of the 1970s also hurt distillates as badly as they did resid. When fuel oil went over $1 gal., home owners switched to gas by the tens of thousands and/or instituted conservation programs that included better insulation, storm windows, and thermostatic controls which reduced the flow of heat by day to the 68-degree level and to the 60-degree level at night. Consumption fell off sharply as a result. Fuel oil reached the $1.30 gal. area before it began to recede.

By 1982, heating oil consumption had fallen to 325-million bbl., and the 1983 projections indicated this total would be less because the winter of 1982-83 was much warmer than normal and the last quarter of 1983 also was on the non-normal side.

Transportation Demand Buoys Sinking Market

Almost like a Sneaky Pete, however, transportation needs for distillates have been growing rapidly in recent years. In 1979, for the first time, transportation—and this includes motor vehicles, trains and marine vessels—took a bigger cut of the distillate output than space heating for the first time in history.

It has been almost phenomenal since then. [See related story in this section.] In 1982, transportation's appetite for distillates stood at 47.7% of the total output, while heating oil's had declined to 33.3%. The 1983 ratio is estimated at 49% for transportation and 31% for heating.

But even more telling is the impact of diesel fuel for on-highway transportation alone. This too has been spiraling. In 1982, on-highway diesel fuel consumption exceeded 338-million bbl., versus space heating's 325-million bbl. Distillate fuels achieved a small comeback in 1983, but more of this went into highway diesel fuel than in space heating. So, this gap can be expected to be wider when the 1983 data are in.

Looking down the road, economist John H. Lichtblau recently made this interesting projection for the two fuel oils:

(billions of bbl.)

	1978	1983	1990
Distillate	1,241	986	1,132
Residual	1,095	511	584

Lichtblau, president of the Petroleum Industry Research Foundation, New York City, stressed that the increases for both distillates and residual fuel oils are not related to space-heating needs. To the contrary, he said, these are expected to decline further but that their losses will be offset by higher demand for diesel fuel,

petrochemical feedstocks and specialty products where distillate is concerned, and a small growth in the industrial/commercial sector where residual is used. [See also Lichtblau's article on the crude oil market, page 128.]

All these negative things lead some economists and far too many industry people to accept the idea that fuel oil is a dying industry that is only running out its string.

There is a hard corps of believers within the industry, however, that refuses to accept this unwarranted death sentence. They feel, as they did in the 1960s and early 1970s, that fuel oil can retain its markets with technological breakthroughs in equipment and performance, with decontrol of natural gas which would close the price gap, and with collective promotion of the product as they did so successfully in bygone years [NPN—Jan. '84, p54].

They have some strong points in their favor.

Allies' Response: NOFI

When the gas utilities began to make horrendous inroads in their traditional markets in the 1950s, the fuel oil people allied with equipment manufacturers and suppliers to support a new group known as National Oil Fuel Institute. The suppliers—at one point, more than a score were in the NOFI apparatus—provided most of the money for fuel oil's "matching fund" programs in which the national office matched the funds raised by local groups all over the country for oil heat promotion.

They were eminently successful in the early years, generating and inspiring cooperative advertising and promotion programs, radio and television shows, traveling exhibits, consumer mailing pieces, media materials, even a consumer paperback book on their own, training schools and educational programs for technicians—a continuous flow of ideas and materials to fight the utility competition. There even were penetrations of the builders and contractors fields where gas and electricity had been capturing the homes of the future by having their equipment installed in the new construction and foreclosing oil as a competitor.

NOFI also took over a basic research program that had been under the sponsorship and direction of the American Petroleum Institute. It generated considerable interest on its own, strove hard but not successfully to get an oil-fired air conditioning unit, pushed blue flame burner development and encouraged inventors—some from overseas—to show up at special demonstration meetings with their "bread board" models which they hope to see developed.

NOFI's financing began to falter in the late 1960s, however, when refiners began to run into tax and internal problems on their support. They began to drop out, and by 1972, just before the Arab oil embargo,

Distillates Level Out After Long Climb

Distillate

(Add 000 bbl.)

Year	Heating Oils	Industrial Use	Oil Company Use	Electric Utility Company	Railroads	Vessels Bunkering	Military Use	Diesel type: On-Highway	Diesel type: Off-Highway	Diesel type: Total Diesel	All Other	Total U.S.
1982(a)	324,912	71,340	29,482	12,134	93,150	33,885	15,201	338,006	37,118	375,124	19,639	974,864
1981(a)	345,728	80,216	29,185	18,192	100,482	41,025	17,763	340,002	38,851	378,853	21,032	1,032,476
1980(a)	393,112	86,089	24,205	31,812	102,022	35,201	19,138	323,431	51,705	375,136	19,994	1,086,709
1975	488,388	63,993	13,633	63,420	93,191	26,138	18,004	217,906	48,977	266,883	10,096	1,043,746
1970	521,135	43,668	11,518	24,770	88,416	19,503	12,447	148,796	46,123	194,919	10,874	927,250
1965	475,992	42,484	10,430	3,661	86,436	15,532	14,953	73,776	50,346	124,122	13,281	786,891
1960	438,010	34,271	8,347	4,724	86,490	18,730	10,793	36,467	38,095	74,562	7,380	683,325
1955	356,589	43,606	8,597	5,884	84,668	16,675	10,945	23,446	20,769	44,215	9,948	581,127
1950	235,740	37,121	5,692	13,207	48,703	12,872	6,553	N.A.	N.A.	21,333	10,085	395,306
1945	128,823	19,071	1,128	6,824	14,458	14,130	30,366	N.A.	N.A.	N.A.	16,825	231,625
1940	119,950	7,330	1,064	4,561	3,194	13,249	1,402	N.A.	N.A.	N.A.	10,342	160,652
1935	53,797	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	86,389

(a)Beginning in 1979, heating oil was dropped as a separate category by Department of Energy, which had assumed jurisdiction for the data. The 1980-81-82 figures were derived by adding residential, commercial and farming categories.

Residual

1982(a)	65,781	122,619	45,319	227,419	170	160,312	7,829	—	—	—	4,784	634,233
1981(a)	67,035	117,024	51,870	325,486	178	188,632	7,008	—	—	—	4,795	762,030
1980(a)	98,034	163,564	59,519	390,105	665	213,131	8,066	—	—	—	4,382	937,466
1975	154,103	116,657	50,847	454,935	583	96,673	19,068	—	—	—	6,066	898,572
1970	185,831	139,647	38,318	312,420	2,222	89,850	28,074	—	—	—	7,295	804,287
1965	156,264	140,602	34,354	114,884	4,001	73,639	40,380	—	—	—	10,004	574,118
1960	125,088	157,270	45,061	85,408	5,610	94,084	31,724	—	—	—	6,291	550,536
1955	86,282	173,030	53,387	75,966	15,018	115,128	28,368	—	—	—	9,804	556,983
1950	72,716	148,111	53,263	93,062	60,878	92,947	28,333	—	—	—	4,898	554,208
1945	43,874	91,176	57,336	57,336	112,297	100,365	97,485	—	—	—	5,200	542,265
1940	44,846	66,610	50,864	50,864	64,904	61,554	15,781	—	—	—	5,313	338,106
1935	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	—	—	—	N.A.	279,596

(a)See footnote above.

Combined Distillate and Residual

1935	76,853	63,576	48,116	23,647	55,651	74,581	10,428	—	—	—	13,133	365,985
1930	43,279	60,762	55,943	26,769	67,900	94,152	8,681	—	—	—	9,875	367,361
1926	22,779	69,336	48,701	33,651	72,218	79,288	6,542	—	—	—	7,514	340,030

Source: American Petroleum Institute Basic Data Book (Sept. 1983), and Petroleum Facts & Figures (1971).

all had departed, leaving a bruised and battered NOFI, its staff reduced and its programs crippled. The embargo and the allocations that followed dealt the death blow, and NOFI was merged into NOJC in 1974.

During the control years, there was only sporadic activity in oil heat promotion and development as the government regulated the flow of product and prices and banned moves that would encourage consumption of any fuel. Since decontrol in January 1981, a group of northeasterners tried to revive a promotional concept and solicit refiner "voluntary" support—a move that got nowhere.

In 1983, NOJC exercised its successorship right and sponsored an oil heat promotional conference of its own [NPN—Oct. '83, p44]. It met with far greater success than had been projected and apparently opened the doors to hopes for a revival of some good ol' days. NOJC already has tentatively scheduled a second national conference for next August.

This is one ingredient the oil heat industry desperately needs, in order to stave off the disappearance of its market. Some sources within the industry think that strong promotional programs on a local basis can once again light the torch and give the industry a chance to grow again, instead of collapse.

Outside of the flame retention burner and the blue flame that has been on the market for years, there has been little in the way of research and development within fuel oil in the past decade. Some equipment manufacturers, most of whom can ill-afford big expenditures for R & D, are pushing only their own product development. That's very good in its own way but does nothing for original concepts.

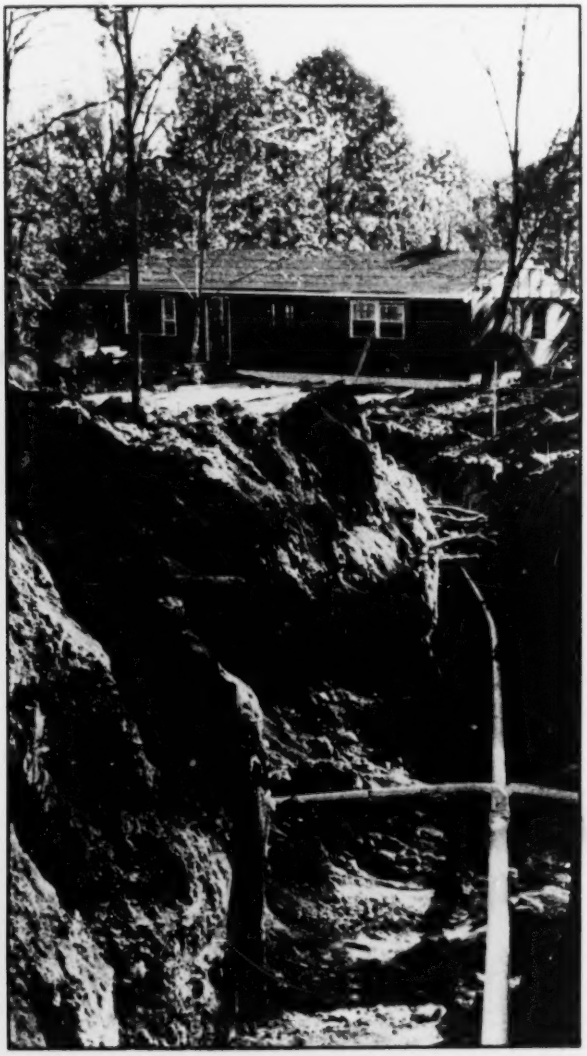
Meanwhile, the face of the industry is changing drastically, as it is in gasoline marketing. Smaller dealers are being forced out of business or into mergers. The big independents are fattening up as a result; but they also are gearing themselves up to do battle with all of their competitors—oil, gas or electricity.

An example of this is Meenan Oil Co., which has been the nation's largest independent fuel oil dealer for at least a score of years. It suddenly was displaced by another firm which seemingly came from nowhere to build up a late 1983 base of more than 150,000 customers on the Atlantic seaboard.

It would appear that the next five to 10 years are going to see more of the same—a gobbling up of the smaller and/or the acquisition of even the fair-sized companies by the more aggressive entrepreneurs.

As *NPN* celebrates its 75th year, fuel oil as an industry is in a state of transition. Its future is being shaped by some forces over which it has no control and others which it can harness to experience a rebirth. Which is the strongest is the question mark for today.

(continued on next page)



In 1979, diesel fuel and fuel oil were about even in terms of distillate use. Diesel since has moved ahead, holding a 47.7% market share.

Fuel Oil Fades, While Diesel Moves Up

OVER the past decade, No. 2 fuel oil lost its position of dominance in the annual consumption of distillates.

As recently as 1970, for example, No. 2 commanded 56% of the distillate production.

Today, it is far less—down around the 31% mark. This is only an educated guess because this article was written at the end of 1983 and figures were not yet available for annual summaries and comparisons.

In 1982, however, No. 2's hold on the space heating marketplace had eroded to 33.3%.

Transportation not only took up the slack but outgunned distillates for space heating. At the end of 1982, diesel fuel for highway transportation alone had a bigger share of the distillate market than No. 2—roughly 13-million bbl. more.

The table shows what happened through the years. (Transportation consists of on-highway consumption by trucks, buses and passenger cars, and by trains and inland and offshore vessels.)

Diesel fuel alone, for on-highway and off-highway consumption, also began to exceed distillate for space heating in recent years.

For example, as recently as 1975, space heating needs consumed 46.8% of the distillate output, while diesel fuel accounted for only 25.6%.

In 1980, however, diesel fuel began a somewhat phenomenal climb. It consumed 34.5% of the output that year compared to space heating's 36.2%. In 1981, it shot past No. 2 by a ratio of 36.7% to 33.5%. And, in 1982, it rammed it home further with a percentage ratio of 38.5%, versus 33.3% for No. 2.

Share of Market—1970/1982

	Transportation	Space Heating
1982	47.7%	33.3%
1981	46.6	33.5
1980	44.2	36.2
1979	38.9	37.5
1978	34.1	42.4
1977	32.3	43.6
1976	32.0	47.2
1975	32.3	46.8
1974	32.3	45.6
1973	30.9	47.3
1972	28.7	50.5
1971	29.2	53.7
1970	27.7	56.2

Diesel fuel consumption continued to rise in 1983, while No. 2 slipped farther. So, there seems to be little doubt that this gap will be widened when the final figures are in for the year just ended.

As indicated above, these diesel fuel figures are for on-highway and off-highway consumption, the latter being mostly stationary engines and power-generation plants. But the off-highway consumption is only a small part of the total diesel fuel consumption—less than 10% in 1982.

In terms of consumption and importance to the oil industry, distillate as a space-heating fuel experienced its greatest years of glory in the 1950s, 1960s and very early 1970s.

During that time, space heating fuels consistently accounted for six out of every 10 barrels of distillates, peaking in 1961 at 65.2% of the output. *NPN 75th*

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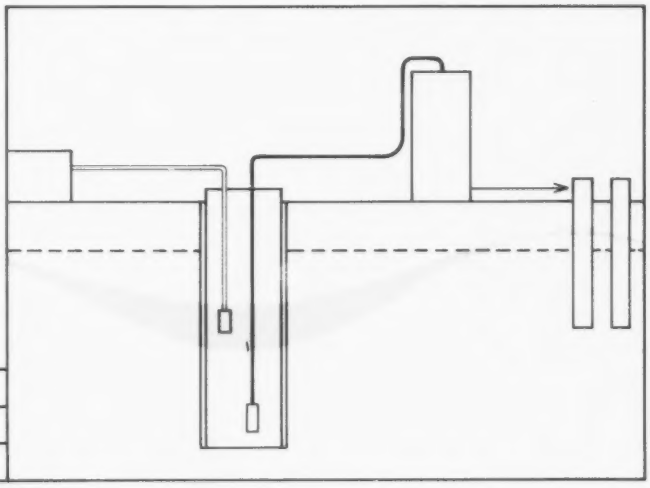

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March 1984

Small Jobber's Dilemma: Reinvest or Not?

MacLeod: How Fair Is Rack Pricing?

Why Rockies Jobber Likes the 'A' of TBA

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Super-Marketers Arise From Fuel Oil Ranks

NATIONAL PETROLEUM NEWS

MARCH 1984 VOL. 76 NO. 3

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25 West Coast
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30 Power Test steps out with 600 Texaco/Getty units

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32 C-stores sold 12% of '82 'gas,' could sell 20% by 1985

32 Two-dozen states mull fuel tax hikes in '84

33 Late '83 demand surge boosts year-end profits

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33 Missouri court rules oral agreement sticks

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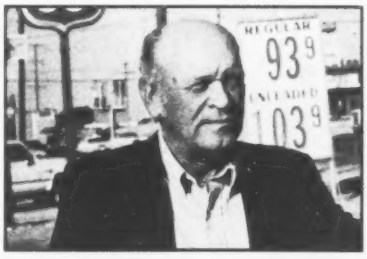
A new era might be dawning in the retail heating oil business, where 'bigness' has never been a part of the industry fabric. Super-marketers are buying up smaller jobbers, and three of the 'supers'—Petroleum Heat & Power, Meenan Oil, and Whale Oil Corp.—have emerged from the pack. – Page 38

Cover art by Ann Feiza, Chicago



Like Luther Glass, many oil jobbers who haven't modernized or rebuilt their retail facilities in recent years face some critical decisions in today's red-hot competition for business. Page 44

A survey of industry experts by the Petroleum Equipment Institute shows a majority believe the small jobber will be extinct by 1995. Bad markets, tank leaks and vapor control will push many 'little guys' over the edge. Page 29

• CATCHING UP

Eleven more U.S. refineries with 500,000 b/d in crude oil capacity closed down during the first 10 months of 1983, according to a recap by the Energy Information Adn.inistration, which anticipates another 75,000 b/d of shutdowns when year-end figures come in.

Refiner	*Location*	*Crude Distil. Capacity*	*Years Operated*
Anchor Refining	McKittrick, CA	9,000 b/d	8
Arizona Fuels	Fredonia, AZ	6,000	11
Demenno-Kerdoon	Compton, CA	10,000	6
Erickson Refining	Point Neches, TX	30,000	4
GHR Energy	Good Hope, LA	300,000	15
Indep. Refining	Winnie, TX	50,000	23
Marion	Theodore, AL	25,000	15
McTan Refining	Augusta, KS	50,000	25
Shore	Kilgore, TX	550	3
Silver Eagle Oil	La Barge, WY	1,500	9
Total:		501,350	*Avg:* 10.8

After much hand-wringing, Arco has decided to market its controversial methanol product, Oxinol, after all, but will support the blend with up to $10-million in advertising in its sole Pennsylvania and New York markets. The company is distributing pamphlets telling drivers it will back any car manufacturer's warranty, if the automaker refuses to honor claims because of damage that might be traced to the blend. In January, officials said the company had paid $600 to seven drivers. Another 60 claims were pending, and 24 claims were dropped.

Gulf has begun testing point-of-sale terminals at 18 stations in the Dallas and Houston areas. Credit card transaction data is transferred through the JC Penney network to Gulf's credit card center in Atlanta. Customers in the two cities have been issued magnetically striped GulfCards. The company, which projects 2,500 stations will have terminals by the end of 1985, also is installing terminals at 20 other Houston stations and expected the start of a test in Pittsburgh by next month.

Southland Corp. is testing fast-food service at several of its 7-Eleven stores and gradually may extend the concept to its 7,300-store chain. Three new stores in Austin, Texas, are involved in the current test, and 20 more new or converted stores will be added to the experiment this year. One Austin store, in addition to selling deli sandwiches, is offering hamburgers. Ovens and stoves soon will bake fresh biscuits, rolls, donuts and Danish.

The country's major distributor of Petrocoal, a methanol blend containing up to 12.5% methanol, is under investigation for alleged misblending. The Environmental Protection Agency says it took company records from United's Phoenix-headquarters in January, but would not comment on the case. A company spokesman says United believes the records will prove its integrity. The incident occurred as EPA was considering revoking or modifying the Petrocoal waiver. [See related story on page 11.]

Sun Refining and Marketing has reshuffled its management team, prompted by the retirement of Gordon Cochrane, vice president, lubes. David Rippy, vice president for branded fuels, has succeeded Cochrane, while David Knoll, vice president for unbranded marketing, has taken over Rippy's old job. T. Daniel Patrick, former manager of Sun Transport, takes over Knoll's old job, while Joseph Mazzei replaces Patrick.

The Reagan administration's 1985 budget proposal calls for a Strategic Petroleum Reserve fill rate of 145,000 b/d and funding of $2.3-billion—nearly two-and-a-half times actual appropriations for 1984. By last month, the Louisiana salt caverns had taken 385-million bbl. toward planned capacity of 750-million bbl.

Gulf Oil Corp. has reincorporated as a Delaware corporation, eliminating cumulative voting and dampening Mesa, Ariz., oil man T. Boone Pickens' fight for company control. Each share of common stock in the former Pennsylvania-based firm automatically converts to one share (or vote) in the Delaware holding company. In addition, Gulf Oil becomes a Gulf Corp. subsidiary.

Gasoline demand edged up 1% or 6.6-million b/d last year versus 1982, the American Petroleum Institute reports. In terms of distillate and residual fuel oil, demand averaged 2.7-million b/d last year—largely unchanged from 1982—although second-half '83 consumption picked up because of the economic upswing. Total product demand, however, fell for the fifth straight year, despite a "vigorous" economic recovery, says API. In addition, roughly 30% of that product demand was met by product imports last year, with more than a third of those imports coming from OPEC nations, says API.

Flying J Propane, Inc., a subsidiary of Flying J Inc., Brigham City, Utah, has sold all interests in its Oregon and Washington propane operations to Vangas, Inc., Fresno, Calif., for an undisclosed amount. Vangas, a 120-outlet subsidiary of Suburban Propane Gas Corp., Morristown, N.J., purchased nine retail outlets, two of which also sell gasoline and diesel.

For the second time in the past three months, a legislator has proposed banning the sale of leaded gasoline. A Minnesota state senator drafted a bill that he hoped would halt the sale of leaded gasoline in that state. An industry source notes, however, that the draft specifically would prevent local refineries from adding lead compounds to gasoline. Late last year, two Chicago aldermen proposed a leaded gasoline ban in Chicago.

Thumbs up for propane. A U.S. Justice Department memo informed the National LP Gas Assn. that its plan to pool member funds to promote propane as an automotive fuel won't run into antitrust barriers, so long as members don't collectively raise prices to cover the campaign. In fact, said Justice, the fund might even spur competition among propane vehicle parts and service suppliers. NLPGA officials last month had not yet worked out details and timetables for the promotion effort.

• TRENDS

More Jobbers Pulling for Minimum Markup Legislation

Oil jobbers, pretty much divided over whether they want or can get retail divestiture or divorcement legislation at the federal level, seem to be turning their attention more toward state minimum markup laws.

Although "below-cost" or "minimum markup" laws at the state level generally have been ineffective to date, more state jobber associations are considering them.

The National Oil Jobbers Council put together an analysis of such legislation in 1983 for its affiliated state members as a guideline, including a draft of a "model" bill. NOJC believes state minimum markup laws remain an "option" for its members, but executive vice president Phillip R. Chisholm indicates it is a rather weak one.

"None of the state minimum markup laws we studied seemed to be very effective," says Chisholm. Among other problems, he adds, product costs have to be defined under such legislation, and "this is virtually impossible to do."

The Texas Oil Marketers Assn. is among state associations now talking about the possibility of pursuing a minimum markup bill. So is the Louisiana Oil Marketers Assn., although that group's executive vice president Robert K. Butcher, says it is barely in the "thinking" stage.

TOMA planned to analyze various options for coping with what it still sees as "predatory" competition in the marketplace at a series of meetings in February and March. It will formalize its plans in time for its annual convention in April.

"We keep getting calls urging us to do something to get the marketplace cleaned up," says TOMA executive vice president Dave Fellers. "Some of our people find that C-stores are now leading things down. We are talking about possible minimum markup legislation, but we haven't forgotten divorcement."

NPN found last year that out of 36 state association executives interviewed, 25 were considering below-cost selling legislation [NPN—June '83, p30]. The Mississippi Petroleum Marketers Assn. at that time had drafted what it considered to be a "model" bill, but it was snuffed out in a House committee.

More recently, Tennessee jobbers have lobbied for proposed legislation that would fix the cost of wholesale gasoline daily throughout the state and require that retail pump prices be at least 6¢ higher.

Jobbers who testified for this legislation late in 1983 attempted to counter arguments that it would raise consumer gasoline prices by saying such a below-cost law would permit them to reduce prices on unleaded grades.

Some oil companies reportedly encourage their dealers to price their leaded regular gasoline with the market, then, make up the lost margin with greater markups on unleaded regular and premium grades.

While the Tennessee jobbers said their proposed below-cost bill would bring about reduced price differentials between leaded and unleaded gasolines, a unique bill has been introduced in Colorado. It would prevent a price spread of more than 20¢ gal. between grades of gasoline. [See story page 21.] And, in Missouri, the push is on for a bill requiring retail margins to fall between 12% and 25%.

While efforts to obtain minimum markup legislation seems to be on the increase, not all branded and unbranded jobbers favor such laws.

"We don't need the government setting the price on anything, and that's what this proposed bill in Tennessee would allow," says Jack Malone, a large branded and unbranded jobber of Memphis. Over the years, Malone has fought similar below-cost Tennessee laws that govern milk and tobacco prices.

"If we didn't have the minimum price laws on milk and cigarettes, a dealer could sell a carton of cigarettes or a gallon of milk at cost," says Malone. "This could be a powerful tool at little investment for him in fighting the competition he has. But because of the laws, he doesn't have these options. It's worse in Arkansas than in Tennessee, too."

Some major companies keep their marketing staffs on the alert to campaign against the minimum markup proposals as they crop up.

—Marvin Reid

• MARKETPLACE AT A GLANCE

AVERAGE GASOLINE PRICES IN THE U.S. (¢ per gal.)

DECEMBER	Gasoline (All types)	Leaded Regular	Unleaded Regular	Leaded Premium
U.S. City Avg.	$1.215	$1.146	$1.231	$1.381
Regions:				
Northeast	1.236	1.169	1.238	NA
North Central	1.232	1.179	1.256	NA
South	1.186	1.111	1.198	NA
West	1.213	1.132	1.234	1.385

Source: U.S. Dept. of Labor, Bureau of Labor Statistics

STOCKS (Add 000 bbl.)

	1.27.84	1.28.83
Gasoline (total)	224,457	250,302
Gasoline (unleaded)*	93,084	102,090
Jet Kerosine **	30,636	34,525
Distillates	122,244	170,282
Residual	43,149	59,681

**Included in gasoline total*

***Jet kero only, totals no longer kept by API or DOE*

Source: American Petroleum Institute